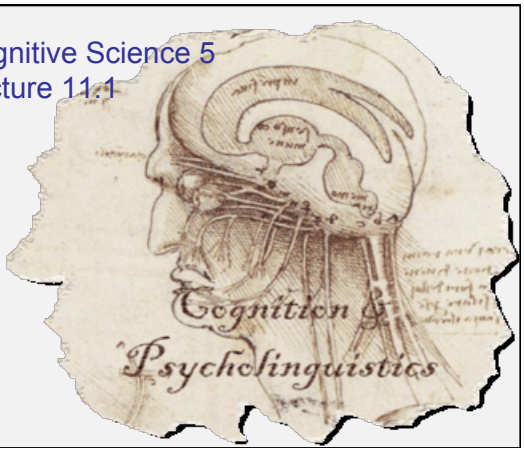
Cognitive Science 5
Lecture 11.1



Last time

Spring break!

This time

Psycholinguistics

Announcements:
Study Guide for Exam 3 posted
Assignment 1

11	4/4 Psycholinguistics 4/6 Analytical tools	CL 12 TBD	 Oana David
12	4/11 ***EXAM 3*** 4/13 Neurolinguistics	 CL 13	
13	4/18 Language in a social context 4/20 Language in a social context	CL14	 Ben Bergen, UCSD
14	4/25 Writing systems AND language and technology 4/27 Language and technology	CL 16 TBD	Jordan Ackerman, UCM Ayme Tomson, UCM Daniel Russell, Google
15	5/2 Music and language 5/4 ***EXAM 4***	TBD	 Enjoy your summer

A few more words on linguistic relativity

Linguistic Relativity review

The idea that language shapes the thinking of people who speak that language

Also known as the Sapir-Whorf Hypothesis

Strong view: language determines/dictates how people think about their world and form concepts

Weak view: language somewhat influences this

Differentiation in language leads to differentiation in concepts in a culture
Examples:
Many words for color → more differences in perception of color
Many words for time → greater awareness of time

A little review for the exam

Language acquisition review

A baby who begins making somewhat systematic sound patterns like na-na, da-da, and mu-mu is ___.

a. babbling
b. cooing
c. choking

Which is an example of a balanced bilingual?

a. A person who spoke English as a child and started learning Spanish as a teenager
b. A person who was raised speaking both English and Spanish
c. A person who leaned English as an adult but speaks it very well

Which is an example of code-switching?

a. Julio is speaking in Spanish and occasionally slips into English without giving it much thought
b. Julio is giving a formal presentation in Spanish and plans to translate a particular part of the story in English
c. Neither

Language and culture review

Who are Benjamin Whorf and Edward Sapir?

a. Psycholinguists
b. 21st Century phonologists
c. Researchers who proposed linguistic relativity

Basic color terms in English

a. yellow, red, grey-ish brown, green
b. yellow, red, blue, green
c. yellow, red, blond, silver

What is interesting about the Pirahã language?

a. Lack of numerals and lack of plural
b. Lack of vowels and verbs
c. None of the above

Which language has an honorific form?

a. English
b. Korean
c. Spanish

Signed language and gesture review

American Signed Language is ___.

a. a real language
b. closely related to British Signed Language
c. gestures that are derived from English

Maria's friend asked her where the restroom is. Maria says nothing but points her finger at a nearby door. This is an example of a ___.

a. manual gesture
b. co-speech gesture
c. beat gesture

Beat gestures ___.

a. lack semantic content
b. show a specific action in the world
c. are the same as emblematic gestures

Quiz 5

Psycholinguistics

Language processing

Our brains are good at making sense of language

How does this work?

Language processing

How many words do we process per minute?

In conversation, our brains process ~200 words per minute

When reading, we process ~250-350 words per minute!

When we first encounter a word, we are often somewhat uncertain about exactly what it is referring to at first

Words are often underspecified (have partial meaning)

We rely on connections to make sense of words/sentences

Psycholinguistics

The study of how language is processed

- Combines psychology and linguistics
- Important area of cognitive science
- Provides insights into how people use, learn, and understand language

Psycholinguistics

Two main areas:

Language comprehension:
understanding sounds, words, phrases

Language production:
producing sounds, words, phrases

Psycholinguist

- A researcher who studies how language is produced and understood
- Collects data by running experiments and testing hypotheses

Quick history of psycholinguistics

Early psycholinguistics

Early 1900s

Wilhelm Wundt (1832-1920) physician, psychologist, philosopher

Believed it was possible to examine mental processes by using methods from natural sciences

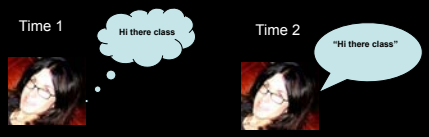
Developed a theory of ***language production***

He viewed the (entire) sentence as the basic unit of language
(not sound + sound; not word + word)

Early psycholinguistics

Wundt believed language production involved putting together a string of ideas to form a sentence in your head BEFORE stating that sentence

This approach still drives some views of language processing today



What are some limitations or problems with this view?

Slightly later

Behaviorism was popular in 1920s:
Human thought is just a behavior that arises from reactions to an environment (=passive process)

1920s to 1950s:
Little serious interest in how the brain processed language; instead, language was viewed as "just verbal behavior"

Note: Psychology and linguistics used to be completely separate

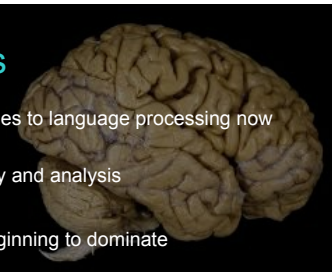
And even later

Late 1950s: psychologists and linguists began to interact a little

The term "psycholinguist" was coined at a conference in the early 1950s

Chomsky not a psycholinguist but his work inspired a great deal of research on the psychology of language

Modern times



Many different approaches to language processing now

Many new tools for study and analysis

Neuroscience is beginning to dominate

Many new findings challenge Chomsky's original claims

Language is now generally viewed as being less modular/ autonomous than it once was

Psycholinguistics

Implicit knowledge
knowing how to do things without conscious awareness of how you are doing it

Explicit knowledge
knowledge of details in performing an act

examples: pronouncing a word like "pesadilla" as a native Spanish speakers versus as a student in Spanish 1 class.

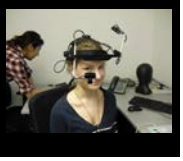
Psycholinguistic experiments test our implicit understanding of sounds, words, and sentences

Basics about experiments

Experimenter
person running the experiment

Participant
person taking the experiment

Variables
things experimenters manipulate, control, measure



Hypothesis
what is being tested

Basics about experiments

Instructions
Tells the participant what to do

Stimuli
What is presented to the participant examples: words, sentences, pictures

Critical items
Stimuli that the experimenter is most interested in, has a measurable response

Filler items
"fake" stimuli that help keep participants from figuring out the experimental manipulation
← what's being varied in the experiment

Practice trial
practice session before the "real" experiment; ensures that sure the participants understands what to do

Variables

Independent variables
What the experimenter manipulates

Dependent variables
What the experiment measures

Dependent Variable

Example:
You're in an experiment that measures response latency and response accuracy

The experimenter measures how quickly and how accurately you read and made decisions about words

You press a button for "yes" or "no" to indicate whether an item you see on the screen is a real word or non-word, for instance, *club, tub, plub*

There are two DVs in this case

For fun: Do the experiment

Two groups – Group 1, Group 2

Group 1 Draw the image that comes to mind

The scar runs from his knee to his ankle

Group 2 Draw the image that comes to mind

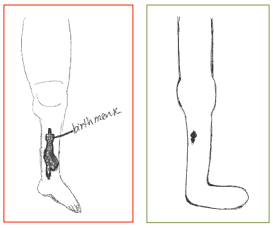
The scar is between his knee and his ankle

Example of variables and a hypothesis in a simple experiment

Participants read only one sentence

The scar runs from his knee to his ankle **(Group 1)**

The scar is between his knee and his ankle **(Group 2)**



Independent variable:
Verb (motion or not)

Dependent variable:
How long is the object drawn (scar)?

Hypothesis: If people think about movement through space when thinking about non-literal motion sentences, we should see this in the way they represent those sentences (e.g., pictures)s

Semantic priming

https://www.youtube.com/watch?v=NGrxUp0pvVo

Another example experiment

Experiment *fast/slow stories*

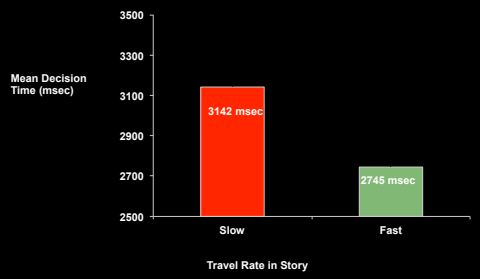
Independent variables
Travel information in stories

Dependent variable
Response time (and accuracy) to a target question
Response = "yes" "no"

Story Slow Version	Story Fast Version
Ted is on vacation on Madagascar	Ted is on vacation on Madagascar
Today he is driving from Toliara to Morombe	Today he is driving from Toliara to Morombe
The towns are 60 miles apart	The towns are 60 miles apart
Both towns are on the coastline	Both towns are on the coastline
They are connected by Route 19	They are connected by Route 19
Ted is driving an old Renault	Ted is driving a new rental car
The car is in bad shape	The car is in excellent condition
Ted is practically crawling on Route 19	Ted is driving fast on Route 19
It takes him over 4 hours to get to Morombe	It takes him only 1 hour to get to Morombe
When he arrives Ted thinks, "That was slow!"	When he arrives Ted thinks, "That was fast!"

Route 19 runs from Toliara to Morombe

Experiment *fast/slow stories*



Some psycholinguistic methods

Some experiments use a keyboard (or a button box) to measure responses, often a binary response like “yes” or “no”

Some use an eye tracking device

An eye tracker monitors, records and measures eye movements while participants do some task, like read a sentence or observe something in the world while listening to language

Some experiments use brain imaging

(another lecture)

More about eye trackers

Devices for measuring fixations and saccades

Gaze at a given point Or region in space

rapid, unconscious ballistic eye movement. Happens all the time but we don`t notice them.

Here are two types

headmounted

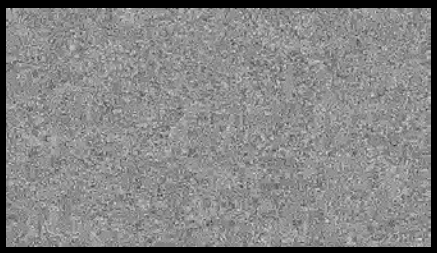
remote

Eye tracking study

https://www.youtube.com/watch?v=m5FH1me_MTk

Why semantic priming matters

More generally, why psycholinguistic work matters



https://www.youtube.com/watch?v=yOrWjIlgBM4

Eye tracking study

Food for thought
What about language?
What are some good ways to capture attention with words in advertising?

https://www.youtube.com/watch?v=5u5mI6PoNkk

Next time

Guest lecture Dr. Oana David, UC Merced

Be sure to review for Exam 3